Many dimensions of the case are still being eagerly pursued by the French press. Some have been looking into the key involvement of a subsidiary of the Banco Ambrosiana of Milan, which was linked to the Vatican before it collapsed with massive debts 2 years ago. Others have been investigating the role of an American, who is said to have helped de Villegas raise some of the initial funding.

Bonassoli himself is unrepentant. Tracked down by Italian journalists last week in the border town of Ventimiglia, he claimed to have deliberately sabotaged the equipment prior to the final experiments and its inspection by Elf because he had not been fully paid by de Villegas; that the scientific principles on which it worked were still valid, although he was not prepared to give any technical details because of the need to maintain commercial secrecy; and that he has offered both French and Italian scientific communities a demonstration and explanation of a new version of the equipment when it is ready in a few weeks time. If they refuse his offer, Bonassoli said in a statement last Friday, "Then I will go to the United States."

—DAVID DICKSON

At EPA, Two Top Scientists Come on Board

They aim to improve the science at the agency and restore credibility

Since William Ruckelshaus succeeded Anne Burford as administrator of the Environmental Protection Agency (EPA), he has replaced virtually all EPA's top administrators with people representing wide experience in government, environmental policy, and science. The selection of these seasoned professionals—in stark contrast to the inexperienced Burford appointees—has been greeted with general approval by environmentalists and industry alike.

The infusion of new blood has boosted morale at EPA. Two appointments in particular are encouraging to scientists within and outside the agency. Bernard Goldstein, chairman of Rutgers' department of environmental and community medicine, was named assistant administrator for the Office of Research and Development. John Moore, deputy director of the National Toxicology Program, became assistant administrator of the Office of Pesticides and Toxic Substances. Together, the two men oversee more than $250 million devoted to environmental research. In separate interviews with *Science*, they described some of the key issues before them and some of their thoughts about research at EPA.

Goldstein, 44, inherits a branch of EPA that under the Burford administration changed hands twice in 3 years and suffered drastic budget cuts. The Administration's budget request for EPA's R & D in fiscal year (FY) 1984, for example, was only about half the FY 1981 level.

Historically the office has had a multitude of problems. There is the perennial debate about how much long-range research EPA should conduct. Congress wants more, but since 1977, the agency has done little to satisfy federal legislators on this point. The quality of EPA's research has never been as highly regarded as that of the National Science Foundation and the National Institutes of Health. And scientists in the R & D office have long complained that they must cater to the research requests of other parts of EPA, and are unable to pursue their own ideas to any great length.

Goldstein's managerial skills will be put to the test. At Rutgers, he directed 25 people and a $2-million budget. At EPA, he is now in charge of a staff of 1800 nationwide and $245 million. The office of research and development includes the support and management of 14 EPA laboratories located across the country as well as research at universities.

Photos by Marjorie Sun

Bernard Goldstein

He intends to provide research stability for scientists at the agency, where there "has not been a history of stability."

Goldstein says "The common theme between the two jobs is that one is always trying to give the researchers the wherewithal to do the science." He says he intends "to provide research stability" for EPA scientists. "There has not been a history of stability here," he notes. His solid scientific credentials have reassured scientists within the agency that they have a manager who understands their language and pursuits. Goldstein, a native of New York City, received his medical degree from New York University School of Medicine. A hematologist by training, he has concentrated for most of his career on studies related to air pollution and its health hazards and has published extensively on toxicity of ozone and benzene. His animal studies on benzene, which demonstrated carcinogenicity through inhalation, provided the impetus for the Occupational Safety and Health Administration under the Carter Administration to regulate the chemical. (This regulation was later overturned by the United States Supreme Court.) From 1977 to 1978, as a National Institutes of Health Fogarty fellow, he conducted research in England.

Goldstein is also fairly familiar with the workings of EPA through his advisory role to the agency during the past 7 years. Since 1978, he has served as a member of EPA's scientific advisory board and, since 1982, has been chairman of the agency's clean air advisory committee. When he was named to the job, there was some grumbling that he was a physician, not an engineer. But Goldstein undercut the complaints by hiring as his right-hand man Donald Ehreth, an engineer who has worked at EPA for many years.

Goldstein says that Ruckelshaus has made it clear that there will be a delineation of authority between the development of the scientific data and the setting of public policy. Goldstein says, "We give him the numbers and he decides what to do about it"—an arrangement that Goldstein says suits him just fine. He adds that Ruckelshaus "is interested in the science and he doesn't want the data sugar-coated."

Of EPA's total R & D budget, only a small percentage is spent on exploratory research. Each year for the past 6 years Congress has ordered EPA in authorization bills to set aside from 15 to 20 percent of its research budget explicitly for long-term research. EPA has never done so. The Reagan Administration's budget cuts have tended to keep EPA's focus on short-term research, because they have been explicitly aimed at tying the agency's R & D more tightly to its regulatory needs. When asked how much short- and long-range research his office should do, Goldstein declines to say. "There's no discrete difference between short- and long-term research," he says. "It's a continuum. My way of thinking is pinpointing what's the crucial information. That may be quick or it may be long term [research]." Goldstein has, however, already asked his top managers to develop 1-year and 5-year goals for research. Previously, the agency usually has only drawn up 1-year plans, according to Goldstein.

One reason perhaps that exploratory research has been given short shrift is rooted in EPA's bureaucracy. Most research must first be requested by agency staff outside the R & D office, such as the office of water quality or the office of toxic substances. As a result, scientists in R & D "are constantly bombarded by program requests," says a congressional staff aide who has followed EPA. An agency scientist may be pulled off one project and put on another, disrupting the continuity of research. The R & D office is the "handmaiden" to EPA, said EPA official Courtney Riordan last year. Riordan was acting director of the office prior to Goldstein's arrival and is now head of the office of monitoring systems and quality assurance under Goldstein. But Goldstein says he does not plan much change in the relationship between his office and others. "We have to work with the [other] offices and aim our research to meet their needs," he says.

Goldstein stresses repeatedly that reputable science and stability of research is his aim. "If a scientist has to abandon a project midway, it has to be for good reason. We have to protect the scientists from the short shifts in research." To strengthen the scientific competence of the agency, EPA will provide support for three to five senior scientists each year to take on temporary appointments in the R & D office to assist in the design and conduct of research projects. The program will cost EPA $500,000 annually. In December, EPA named the first three scientists to the program. In the future, however, the selections will be made by the National Research Council's Environmental Studies Board.

The desire to renew morale and upgrade the quality of science is echoed by John Moore, the new head of the Office of Pesticides and Toxic Substances. His predecessor, John Todhunter resigned in the wake of the storm at EPA.

Moore says his role as head of a regulatory office is to develop a rational policy from the scientific data. To balance his scientific background, he has hired a lawyer, James Davis, as his special assistant. Davis received his doctorate in organic and theoretical chemistry from California Institute of Technology and then went on to earn a law degree from the University of Virginia.

John Moore

He favors more toxicity data from companies. "Look at where I come from. I'm a toxicologist."

Moore, who is also 44, is a native of Salem, Massachusetts, and received a degree in veterinary medicine from Michigan State University. He is widely respected as a toxicologist and is an expert on dioxin, which will serve him well as EPA undertakes a major program to resolve the myriad of problems related to this chemical.

As a manager, he receives good marks from his colleagues at the National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina. Since 1978, Moore has been deputy director of the $55-million toxicology program in which he directed 200 people.

With a staff of 1000 and a budget of $126 million, he heads one of EPA's most visible branches. His office, for example, is responsible for implementing the Federal Insecticide, Fungicide, and Rodenticide Act and the Toxic Substances Control Act. Both laws regulate the manufacture, production, and disposal of most chemicals. EPA also plans to use these laws to regulate biotechnology, an issue that has generated much discussion over the past few months.

This year both laws are due for reauthorization. The toxics law is especially contentious. For example, chemical manufacturers currently are not required to submit toxicity data on new chemicals to EPA. Some critics of the law would like to see it substantially strengthened to make submission of toxicity data mandatory. Representative James Florio (D–N.J.), chairman of the House subcommittee which oversees the toxics law, recently introduced legislation that would accomplish this, but industry opposes the proposal. Moore, however, favors having more data. "Look at where I come from. I'm a toxicologist. I'm somewhat uncomfortable without some data. He adds that "there might be some argument for flexibility [concerning] what tests should be done."

Along the same lines, Moore supports the idea of gathering more toxicity data on chemicals which are already on the market. In the past, companies submitted the data on a voluntary basis to EPA. Florio has sponsored a bill that would give the agency the power to enforce the submission of the data after a manufacturer and EPA have negotiated what information is needed. In Moore's opinion, the Florio bill "may be a good idea." But Moore stresses that the agency has not yet taken an official position on the legislation.

Moore and Goldstein hope to work closely together on at least two major topics—biotechnology and risk assessment. Goldstein said that his office will be devoting more money to biotechnology research in the next budget.

Part of this research will overlap with the agency's efforts to improve risk assessment. Agency scientists would like, for example, to assess the ecological risks of biotechnology products. Ruckelshaus himself has put a high priority on the development of risk assessment in general. In a speech before the National Academy of Sciences in the fall, he stressed the need for consistency within EPA and among the various federal agencies in the way risk assessment data is developed and interpreted. Moore says, "I'm not sure there should be a rigid way of determining risk assessment according to a cookbook. But we need consistency, for example, in how we [analyze and interpret] a specific tumor" found in animal studies.

The appointments of Goldstein and Moore have heartened EPA's rank and file. Their scientific credentials have impressed the staffs as well as their willingness to talk to them, according to career EPA officials. "There is much more open dialog now," says a chemist at the agency.—**MARJORIE SUN**